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he said most justly, "he was a kind and generous friend to the young men and particularly solicitous for their advancement."

These were the qualities which made Dr. Dudley so successful as president of the American Chemical Society. In that high office his kindly diplomacy and great tact enabled him to harmonize many conflicting interests, and to so largely help to advance the interests of the society and bring it to that excellent condition of harmony and efficiency which now prevails.

This book will be a valuable addition to all libraries and particularly to those of the younger generation. It should be read and pondered by all men.

WILLIAM McMURTRIE

Taschenbuch für Mathematiker und Physiker.

By FELIX AUERBACH and RUDOLF ROTH. Leipzig, B. G. Teubner. 2 Jahrgang, 1911.

The second volume of the "Taschenbuch" consisting of 580 pages, may not correspond to the American idea of a "Taschenbuch," but it is an unusually convenient "Handbuch" for mathematicians and physicists. A part of the table of contents is of value only or chiefly to residents of Germany—the calendar for Berlin, the table of magnetic elements for central Europe, the "Verzeichnis der Hochschullehrer"—but with these exceptions the entire book is of general interest. The articles dealing with astronomical facts concerning planets and comets, the tables of astronomical and geodetic constants, the four-place logarithm tables of numbers and trigonometric functions, the tables of squares and Bessel functions, the numerous tables of all the important physical constants, call for no review. One notes, however, how admirable is the synopsis of the fundamental definition and operations of mathematics. A candidate for a doctor's degree in physics would do well to master the mathematical portion of this volume. Not only is here given the theoretical groundwork of the subject, there are also given labor-saving applications; *e. g.*, the complete Fourier's series are worked out for a number of common

forms of the function. There is also an application to life-insurance mathematics.

The synopsis of the fundamental principles of physics, while lacking the continuity of the mathematical synopsis, is none the less complete. There is here condensed what one ordinarily finds spread over several volumes of general physics.

The article which will be of the greatest interest to readers of the "Taschenbuch" is that on the principle of relativity by Willy Wien. It is an historical and a critical summary, complete at least in its physical aspect. The contributions to this theory made by Minkowski are briefly set forth not only in this article but also in the review of Minkowski's work with which the book opens. That one who has contributed so much to this far-reaching theory should be cut off in the very prime of his power is to be greatly deplored. Physicists and mathematicians will be pleased to have the portrait of Minkowski which accompanies the article. G. F. HULL

SPECIAL ARTICLES

CONCERNING A NEW ARRANGEMENT OF THE ELEMENTS ON A HELIX, AND THE RELATIONSHIPS WHICH MAY BE USEFULLY EXPRESSED THEREON

In this abstract of a paper which, under the title "Helix Chemica," has been published in *The American Chemical Journal*, Vol. XLV., p. 160, 1911, the writer wishes to explain briefly the grounds of the proposed arrangement and to illustrate by a few examples the many uses to which the helix may be put to bring out and compare the complex relationships of the elements.

In Fig. 1 the helix is presented from the side, in Fig. 2 from the end, where of course the front curve of each series hides those behind it. In Figs. 3-6 the curves are drawn as if they were on the end of a barrel, enabling one to see the groups and series at the same time. A great number of harmonic relations are presented on these figures, only a few of which can be discussed in this abstract. The system uses the series of Mendeléeff, but makes one half of each group the antithesis,